

FUEL SYSTEMS FOR IC ENGINES INJECT YOUR IDEAS, FUEL YOUR TECHNOLOGY

Institution of
**MECHANICAL
ENGINEERS**

10-11 March 2015
One Birdcage Walk, London
www.imeche.org/events/C1409

Combustion Engines & Fuels Group
Conference



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FUEL SYSTEMS FOR IC ENGINES INJECT YOUR IDEAS, FUEL YOUR TECHNOLOGY

10-11 March 2015, One Birdcage Walk, London



THE AUTOMOTIVE INDUSTRY MUST CONTINUE TO MEET THE DEMANDS OF THE MODERN ENVIRONMENTAL AGENDA. TO EXCEL, MANUFACTURERS MUST RESEARCH AND DEVELOP FUEL SYSTEMS THAT GUARANTEE THE BEST ENGINE PERFORMANCE, ENSURING MINIMAL EMISSIONS AND MAXIMUM FUEL ECONOMY.

The next conference in the fuel injection systems series for internal combustion engines will focus on the latest technology for state-of-the-art system design, characterisation, measurement and modelling, addressing all technological aspects of diesel and gasoline fuel injection systems. This will range from fundamental fuel spray theory, component design, to effects on engine performance, fuel economy and emissions.

MEDIA PARTNERS:



BENEFITS OF ATTENDANCE:

- **Hear** about latest development in fuel pressurisation and fuel injection systems
- **Understand** the response from industry to alternative fuel systems
- **Learn** about pioneering, cutting-edge designs
- **Explore** strategies to maximise engine performance whilst reducing emissions
- **Consider** international approaches to fuel systems evolution

SPONSORSHIP & EXHIBITION OPPORTUNITIES

GET INVOLVED

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PROGRAMME

DAY 1

TUESDAY 10 MARCH 2015

- 09:00** **REGISTRATION AND REFRESHMENTS**
- 09:30** **CHAIR'S OPENING REMARKS**
Roy Horrocks, Chair of the organising committee
- 09:45** **KEYNOTE SPEAKER**
Bob Griffiths, Manager - Performance Components, FoE Engine Design
- 10:30** **NETWORKING REFRESHMENT BREAK**

SESSION 1 - DIESEL INJECTORS

Chair - Bruno Annycke, Head of Project Management, Pumps & Rails, DELPHI Diesel Systems

- 10:50** **ADVANCED DIGITAL RATE SHAPING FOR FURTHER OPTIMISATION OF DIESEL COMBUSTION PROCESS**
D Naber, H Schumacher, H P Frisse, Robert Bosch, Germany
- 11:10** **CHASSIS DYNAMOMETER TEST METHOD FOR EVALUATION OF INJECTOR NOZZLE DEPOSIT EFFECTS IN DIESEL PASSENGER CARS**
R G Williams, A Smith, Fuel Technology Group, Shell Global Solutions, UK
- 11:30** **INVESTIGATION ON ADVANCED COMMON RAIL INJECTOR IMPROVEMENTS CHALLENGE TO BALANCE ROBUSTNESS, FUEL ACCURACY AND EMISSIONS POTENTIAL**
J Weber, J Ruwe, N Sashima, J Hagen, DENSO Automotive Deutschland, Germany
D Ueda, S Sugawara, K Uchiyama, K Ishizuka, DENSO Corporation, Japan
- 11:50** **Q&A SESSION**
- 12:10** **NETWORKING LUNCH**

SESSION 2 - GASOLINE DIRECT INJECTION

Chair - Ian Williams, Senior Engineering Manager - Powertrain Engineering, Denso International Europe

- 13:00** **NEW AUTOMOTIVE FUEL INJECTOR ACTUATOR TECHNOLOGY RIVALS PIEZO-ELECTRIC PERFORMANCE AT SOLENOID COST**
A N Dames, H J Meanwell, J A M Dilley, A H Burrell, J W Evett, Sentec, UK
- 13:20** **EFFECTS OF INJECTOR NOZZLE DEPOSIT ON SPRAY PATTERN AND MIXTURE PREPARATION IN AN OPTICAL DISI ENGINE**
M Anbari Attar, T Badawy, H Xu, Vehicle and Engine Technology Research Centre, University of Birmingham, UK
- 13:40** **GASOLINE DIRECT INJECTION SPRAY IMPROVEMENTS FOR FUTURE EMISSION LEGISLATION**
H Shibata, T Kito, S Saitoh, DENSO Corporation, Japan; M Walford, I Williams, H Kaneta, DENSO International, Europe
- 14:00** **Q&A SESSION**
- 14:20** **NETWORKING REFRESHMENT BREAK**

SESSION 3 - SIMULATION

Chair - Prof Colin Garner, Perkins/Royal Academy of Engineering Professor of Applied Thermodynamics, Loughborough University

- 14:40** **SIMULATION OF CAVITATION INSIDE DIESEL INJECTORS, INCLUDING EROSION MODELLING**
P K Koukouvinis, G Bergeles, A Theodorakakos, M Gavaises, School of Engineering and Mathematical Sciences, City University, UK; J Z Li, L Wang, Caterpillar Inc, USA
- 15:00** **THE MODELLING OF MULTI-COMPONENT DROPLET EVAPORATION, INCLUDING SUPERHEATED DROPLETS**
J D Camm, R Stone, M H Davy, Department of Engineering Science, University of Oxford, UK
- 15:20** **NETWORKING COFFEE BREAK**
- 15:40** **INVESTIGATING CONTROL FUNCTIONS IN HIGH PERFORMANCE INJECTORS**
D Bush, CCE Soteriou, M Winterbourn, C Daveau, Delphi Diesel Systems, UK
- 16:00** **NUMERICAL INVESTIGATION OF CAVITATING INJECTOR FLOW ACCOUNTING FOR 3D-NEEDLE MOVEMENT AND LIQUID COMPRESSIBILITY EFFECTS**
B Mandumpala Devassy, V Caika, P Sampl, W Edelbauer, AVL LIST GmbH, Austria; D Greif, AVL, Slovenia
- 16:20** **SPRAY IMAGING AND DROPLET SIZING OF SPARK-ERODED AND LASER-DRILLED INJECTORS WITH GASOLINE-BUTANOL AND GASOLINE-ETHANOL BLENDS**
P G Aleiferis and M K Behringer, Department of Mechanical Engineering, University College London, UK; D OudeNijeweme, P Freeland, MAHLE Powertrain, UK
- 16:40** **Q&A SESSION**
- 17:00** **CLOSE OF DAY ONE**
- 19:00** **CONFERENCE DINNER**
HQS Wellington, Temple Stairs, Victoria Embankment, London
After-Dinner Speaker:
Dr. Rainer W. Jorach, Director Product Engineering, Business Unit Passenger Car Europe, Eberspächer Exhaust Technology GmbH & Co. KG

DAY 2

WEDNESDAY 11 MARCH 2015

- 08:30** **REGISTRATION AND REFRESHMENTS**
- 09:00** **CHAIR'S WELCOME**
Roy Horrocks, Chair of the organising committee
- 09:10** **KEYNOTE**
Hartwig Busch, Principal Engineer for Performance, Jaguar Land Rover

SESSION 4 - GASOLINE DIRECT INJECTION

Chair - Roy Horrocks, Organising committee

- 09:40** **ASSESSMENT OF FEASIBLE SYSTEM SOLUTIONS FOR FUTURE PARTICLE EMISSION REQUIREMENTS**
A Kufferath, A Storch, J P Bronner, R Busch, Robert Bosch, Germany
- 10:00** **INFLUENCE OF GDI MULTI-HOLE FUEL SYSTEM PRESSURE ON SPRAY AND ENGINE EMISSIONS**
G Hoffmann, B Befrui, A Berndorfer, W F Piock, Delphi Powertrain Systems, Luxembourg; D L Varble, Delphi Powertrain Systems, USA

10:20 Q&A SESSION

10:40 NETWORKING REFRESHMENT BREAK

SESSION 5 - HEAVY-DUTY AND MARINE

Chair - Denis Gill, Project Manager, AVL

11:00 HEAVY DUTY FUEL SYSTEMS - DEVELOPING THE NEXT GENERATION
K Chapman, M De Bruijn, L Dransfield, R Goold, Delphi Diesel Systems: Powertrain Systems CV FIE, UK

11:20 INJECTION PRESSURE AS A MEANS TO GUIDE AIR UTILISATION IN HEAVY DUTY ENGINE COMBUSTION
H Dembinski, Scania AB, Sweden, H E Angstrom, Royal Institute of Technology, Sweden, E Winklhofer, AVL List, Austria, and Royal Institute of Technology, Sweden

11:40 LIQUID METHANOL CR INJECTION ON A WARTSILA-8L40 CM BORE MEDIUM SPEED ENGINE
D C Jay, M Mäenpää, F Cavressi, M Laine, Wärtsilä, Finland

12:00 Q&A SESSION

12:20 NETWORKING LUNCH

SESSION 6 - FUEL EFFECTS

Chair – Philip Hore, Director of Quality, Technical Consulting – Engines, Ricardo UK

13:10 FUEL COMPONENT CONTRIBUTIONS TO DIESEL FUEL FILTER BLOCKING
A Fersner, J Galante-Fox, Afton Chemical, USA

13:30 INFLUENCE OF FUEL COMPOSITION ON CAVITATION INCEPTION AND FURTHER DEVELOPMENT IN DIESEL FUEL INJECTORS
A Theodorakakos, M Gavaises, School of Engineering and Mathematical Sciences, City University, UK; R Pearson, M Gold, Formulated Products Technology, BP International, UK

13:50 ADVANTAGES OF REFINED FUEL INTRODUCTION FOR MODERN DI DIESEL ENGINES WITH RESPECT TO COMBUSTION EFFICIENCY AND EMISSION COMPLIANCE
T Körfer, FEV Group Holding, Germany; P Grzeschik, H J Laumen, H Rohs, FEV, Germany; B Graziano, B Heuser, Institute for Combustion Engines (VKA), RWTH Aachen University, Germany

14:10 Q&A SESSION

14:30 NETWORKING REFRESHMENT BREAK

SESSION 7 - DIESEL HIGH PRESSURE PUMPS

Chair - Ken Ind, Manager Diesel System Applications, Robert Bosch

14:50 CHALLENGES AND STRATEGIES FOR DIESEL HIGH PRESSURE FUEL PUMPS DEVELOPMENT DEDICATED TO THE COMMERCIAL VEHICLES MARKET
U Nigrin, C Rosu, M Schmidt, B Gugel, L Vasile, S Fink, J Massinger, Continental Mechanical Components, Germany

15:10 DELPHI NEW DIESEL COMMON RAIL FAMILY: FOCUS ON HIGH PRESSURE PUMPS
M Lyon, J McHattie, C Cardon, Delphi Diesel Systems, UK

15:30 REVIEW OF MEASUREMENT TECHNIQUES FOR QUANTIFYING RATE OF INJECTION
Y Hardalupas, Imperial College London, UK; D Pearce, Delphi Diesel Systems (Test Systems) and Imperial College London, UK; A Taylor, Imperial College London, UK

15:50 Q&A SESSION

16:10 CLOSE OF CONFERENCE

Find out more about our speakers at www.imeche.org/events/C1409

- This programme is subject to change.
- The Institution is not responsible for the views or opinions expressed by individual speakers.

Organising committee:

With thanks to the Combustion Engines & Fuels Group

- Roy Horrocks, Chair of the organising committee
- Bruno Annycke, Head of Project Management, Pumps & Rails, DELPHI Diesel Systems
- Denis Gill, Project Manager, AVL List GmbH
- Philip Hore, Director of Quality, Technical Consulting – Engines, Ricardo UK Ltd
- Manolis Gavaises, Chair in Fluid Dynamics, School of Mathematics, Computer Science and Engineering, City University, London
- Frank Atzler, Advanced Development Powertrain Leading Diesel Combustion Expert, Continental Automotive
- Colin Garner, Perkins/Royal Academy of Engineering Professor of Applied Thermodynamics, Loughborough University
- Ian Larbey, Director Projects and Applications, Diesel Systems, Robert Bosch GmbH
- Ian Williams, Senior Engineering Manager Powertrain Engineering, Denso International Europe
- Ken Ind, Manager Diesel System Applications, Robert Bosch

BOOKING FORM

EVENT CODE: C1409AB

FUEL SYSTEMS FOR IC ENGINES

10-11 March 2015
One Birdcage Walk, London SW1H 9JJ

REGISTRATION Please complete in capitals.

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Do you have any special requirements?	

How did you hear about this event? Direct mail Website Colleague Other

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FEES AND CHARGES Please complete the appropriate box.

Registration fees include entry to the sessions, refreshments, lunch and a copy of the event proceedings.

	STANDARD RATE	VAT	TOTAL
Member, Institution of Mechanical Engineers	£660.00	£132.00	£
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Non-member	£840.00	£168.00	£
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Presenting Author	£440.00	£88.00	£
Conference Dinner	£30.00	£6.00	£

PAYMENT DETAILS

Payment must accompany this registration form. Registration will be confirmed only on receipt of full payment.

PLEASE INDICATE METHOD OF PAYMENT:

- Cheque** Cheques should be made payable to IMechE and crossed. Please note international delegates may pay only by credit card, BACS or banker's draft. A copy of the draft must accompany this form. It is the delegate's responsibility to pay any bank charges.
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Completed application forms should be returned to the address above, along with the correct payment. Attendance at the event will be confirmed on receipt of the full balance. All participants are advised to bring a copy of their confirmation with them on the day, to ensure the fastest possible entry.

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Please inform us of any special requirements, ie. dietary or access, on the relevant section of this form.

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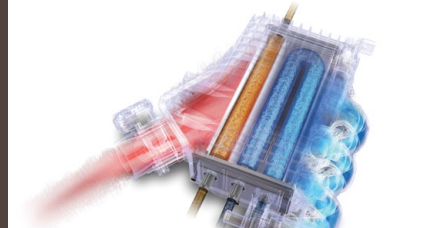


27 January 2015
Coventry

DEVELOPMENTS IN TRANSMISSION AND DRIVELINE TECHNOLOGY

Picking up from previous driveline events that have led the way in ground-breaking developments, this seminar will not only address transmission strategies for passenger cars, but also new concepts for heavy duty and off-highway vehicles, providing you with a full spectrum of knowledge on all automotive machines.

www.imeche.org/events/S6187

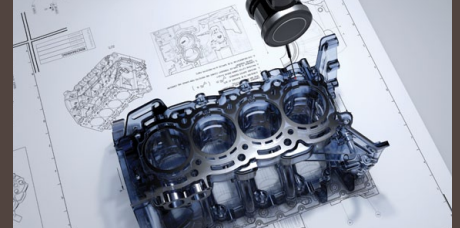


10-13 May 2015
Nottingham

VTMS 12

VTMS 12 will cover the latest research and technological advances in the field of heat transfer, energy management, thermal comfort and the efficient integration and control of all thermal systems within the vehicle. The programme will feature plenary sessions, breakout technical sessions, panel discussions, and an associated exhibition.

www.imeche.org/events/C1400



2-3 December 2015
London

INTERNAL COMBUSTION ENGINES

This conference provides a forum for IC engine experts looking closely at developments for personal transport applications, as well as the many drivers of change that apply across light and heavy duty vehicles, on and off highway transport as well as other sectors.

www.imeche.org/events/C6175

INFORMATION AND BOOKINGS

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1 Birdcage Walk
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